

Honors Algebra 2 Quiz REVIEW 5.1 and 5.2

Name Key

Evaluate the expression without using a calculator.

1. $256^{3/4}$

$$4 \sqrt[4]{256}^3 = \frac{4 \cdot 4 \cdot 4 \cdot 4}{16 \cdot 16} = 256$$

$$(4)^3 = 4 \cdot 4 \cdot 4 = 64$$

64

2. $(-27)^{2/3}$

$$\sqrt[3]{-27}^2 = (-3)^2 = 9$$

$$\frac{16}{16} \cdot \frac{16}{16} = \frac{160}{256}$$

9

3. $1296^{1/4}$

$$\sqrt[4]{1296} = \frac{6 \cdot 6 \cdot 6 \cdot 6}{36 \cdot 36} = 6$$

$$\frac{36}{36} \cdot \frac{36}{36} = \frac{216}{1080} = \frac{1296}{1296}$$

6

4. $(\sqrt[5]{729})^5$

$$\frac{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3}{9 \cdot 9} = 729$$

$$\frac{81}{9} = 9$$

$$(3)^5 = 243$$

$$\frac{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3}{9 \cdot 9 \cdot 3} = 243$$

$$\frac{81}{3} = 27$$

243

For numbers 5-6, find the real solution(s) of the equation. Round your answer to two decimal places when appropriate.

5. $x^6 + 61 = 78$

$$\sqrt[6]{x^6} = \sqrt[6]{17}$$

$$x \approx \pm 1.60$$

6. $\sqrt[4]{(x+1)^4} = \sqrt[4]{642}$

$$x + 1 = 5.03$$

$$x = 4.03$$

$$x = 6.03$$

7. Find the indicated real n th root(s) of a .

$n = 4, a = -1296$

4 is even and -1296 is negative so there are no real solutions.

For number 8, simplify the expression.

8. $\sqrt[7]{\frac{v^{18}p}{v^4p^6}}$ $\sqrt[7]{v^{14}p^7}$

v^2p

9. The discharge of water Q (in cubic feet per second) as it flows through an open ditch can be measured with Manning's formula:

$$Q = \frac{1.486}{n} R^{2/3} S^{1/2}$$

In the formula, n is the roughness factor, R is the mean hydraulic radius (in feet), and S is the slope. What is the approximate discharge of water from a ditch with a roughness factor of 0.058, a radius of 1.7 feet, and a slope of 0.08?

$$Q = \frac{1.486}{0.058} (1.7)^{2/3} (0.08)^{1/2}$$

$Q \approx 10.32 \frac{ft^3}{second}$

For numbers 10 and 11, write the expression in simplest form. Assume all variables are positive.

10. $\sqrt[4]{\frac{80n^6p^8}{5n^2p^6}}$ $\sqrt[4]{16n^4p^2} = 2n\sqrt[4]{p^2}$

11. $\frac{\sqrt[6]{p^8}}{\sqrt[7]{p^4}} \cdot \frac{\sqrt[7]{p^3}}{\sqrt[7]{p^3}} = \frac{p^{8/6} p^{3/7}}{p} = p^{16/21}$

$\sqrt[21]{p^{16}}$

$\frac{225}{515}$
5.9

For numbers 12-13, write the expression in simplest form.

12. $\frac{\sqrt[3]{9}}{\sqrt[3]{5}} \cdot \frac{\sqrt[3]{25}}{\sqrt[3]{25}} = \frac{\sqrt[3]{225}}{5}$

13. $\frac{3(4+\sqrt{3})}{(4-\sqrt{3})(4+\sqrt{3})} = \frac{12+3\sqrt{3}}{16-3}$

$\frac{12+3\sqrt{3}}{13}$

$1^3 = 1$
 $2^3 = 8$
 $3^3 = 27$
 $4^3 = 64$
 $5^3 = 125$

For numbers 14-15, perform the indicated operation. Assume all variables are positive.

14. $10\sqrt[3]{n} + 5\sqrt[3]{n}$

$15\sqrt[3]{n}$

15. $\sqrt[3]{64w^5} - 11w\sqrt[3]{w^2}$

$4w\sqrt[3]{w^2} - 11w\sqrt[3]{w^2}$

$-7w\sqrt[3]{w^2}$

16. Find the indicated real n th root(s) of a .

$n = 5, a = 1$

5 is odd and 1 is positive there
is 1 real solution